# Practices of disciplinarity and interdisciplinarity in Quebec elementary schools: Results of twenty years of research

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## Contents



**Abstract** – This article presents a synthesis of different research projects that have been carried out in the province of Quebec, Canada over the past 20 years concerning the representations and practices of elementary teachers regarding the relative importance given to subject matter and the use of interdisciplinarity in their teaching practice. The first section will explain the context of the Quebec school system on a socio-historical and political level and review the emergence of the concept of interdisciplinarity in Quebec. The second section will present succinctly the different research projects that have been conducted since 1980 and the conceptual framework they were based on. The third section will consider the main results of the various research projects from two angles: first, the representations and practices of the teachers regarding interdisciplinarity; secondly, the relative importance and role that the teachers give to interdisciplinarity. In the conclusion, we will highlight among other things the central position teachers give to the role of socialization and their minimal consideration for the teaching of disciplinary knowledge.

## 1. Introduction[1]

Since 1970, three elementary education curricula followed one after the other, all of which the Ministry of Education of Quebec promoted explicitly the use of interdisciplinarity. However, the governmental discourse was the source of great confusion, because it didn't present its orientations in a clear enough fashion. Although many people involved in the educational system – such as pedagogical advisers, as well as university professors – looked into this thorny question since then, more specifically during the 1970s and the early 1980s, it has mainly been from an implementational and apologetic perspective (Larose, Lenoir 1998; Lenoir 1991). It is in fact only since 1985, with our first research on teaching practices, especially on the use of the interdisciplinary approach by elementary teachers, that a description and a better understanding of those interdisciplinary practices have been progressively established.

In this article, we will give a synthesis of the state of the research that we have carried out in the past 20 years in Quebec dealing with the representations and practices of elementary teachers regarding the relative importance given to school subjects and the choice of interdisciplinarity in their teaching practice. The first section will contextualize the Quebec school system from a socio-historical and political point of view and then review the emergence of the concept of interdisciplinarity in Quebec

1 We would like to express our gratitude to Pierre-Albert Coubat, research professional for the *Centre de recherche sur l'intervention éducative* (CRIE) the Center for Educational Intervention for the first translation of the article in English and, particularly, to Anne Catherine McConnell, student member of the CRIE who is pursuing doctoral studies in Education under the direction of the author, for her revision of the translation.





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under the name of "*integration des matières*" ("subject matter integration"), as well as outline what was at stake from a socio-cultural and educational point of view and underlied this emergence. The second section will briefly present different research projects undertaken after 1980 and the conceptual framework on which they are based concerning the projects that we have directed. The third section is reserved for the presentation of the main research results which are considered from three angles: first of all, the teachers' representations and practices regarding interdisciplinarity, which refer, on one hand, to the epistemological position taken by the teachers regarding interdisciplinarity and on the other hand, to the different methods of operationalization of the practice of interdisciplinarity; second of all, the relative importance and the role that teachers give to interdisciplinarity which refers to the links that teachers establish between school subjects and their hierarchy. To conclude, we will highlight the central place that teachers assign to the role of socialization and the minimal consideration they give to the teaching of disciplinary knowledge, which a certain interpretation of the new elementary curriculum by the elementary teachers seems to confirm.

## 2. Context

We remind you that to begin with, on the political level, like every other province of Canada, Quebec has a provincial Parliament, as stipulated in the British North America Act (BNAA) that established the Canadian Confederation in 1867, which holds exclusive jurisdiction in certain fields, such as education, whereas the jurisdiction in other fields is shared with the federal government – immigration for example – or is under the federal institutions' responsibility, such as the case of the National Defence. As a result, each province has its own education system and curricula. These curricula are aimed at pre-school (two years for children of 4 and 5 years old), elementary (six years for students from 6 to 11 years old) and secondary (five years for students from 12 to 16 years old) education systems which are designed and developed by the government and are then implemented in the schools through the school boards. School boards are legally constituted organisations that are mandated by provincial government to assume in a particular territory a series of administrative, educational, legal, economic, etc. responsibilities that are linked to the education of youth.

Since the beginning of the 20th century, Quebec has experienced several elementary curricula. Table 1 synthesises the successive conceptions of elementary curriculum in Quebec along with the corresponding epistemological perspective that was officially promoted. We will concentrate only on the last three curricula.

**Table 1**
**Successive concepts of the elementary education curriculum in Quebec, 1909-2005**

| Periods | Curricula | Epistemological conceptions |
|---|---|---|
| 1909-1958 | Encyclopaedic program | Realistic concepts |
| 1959-1970 | Encyclopaedic program | Realistic concepts |
| 1971-1980 | Outline program | Inductivist concepts |
| 1981-2000 | Behavioural objective program | Neo-behaviourist concepts |
| 2001- | Fields and competencies program | Constructivist concepts |

With the introduction in 1970 of the Outline Programs, the Ministry of Education started to give more importance to what was then called "l'intégration des matières" (subject matter integration". We venture to pose two hypotheses to explain this choice of expression instead of the choice of interdisciplinarity. On the one hand, the literal translation of the American expressions "*content integration"* and "*knowledge integration"* is *"integration des matières"*. On the other hand, the expression "*intégration des matières*" met a North American humanist conception strongly influenced by the works of Bany and Johnson (1969), Kaye and Rogers (1971), and especially Rogers (1972*a*, 1972*b*). It was then applied to a teaching conception which focuses on the child's blossoming, the individual education of the "moi intérieur" (inner self), the self-education and the necessity of 'learning to learn', as well as the use of active methods and nondirective approaches, from the perspective of social integration. This "intégration des matières" gave many teachers a reason not to teach certain subjects they considered less useful, irrelevant or with which they did not feel any affinity in order to claim a holistic education in which all teaching occurred through the learning of the mother tongue, etc. These aspects have been already clarified in two other texts by the author (Lenoir, Geoffroy 2000; Lenoir, Laforest 2004).

Faced with what seemed to be a generalised lack of rigour in education, but also in regard to the government's focus that education be oriented towards the economy and technology, there was an urgent demand to regain control of the school project, (Conseil supérieur de l'éducation 1976). A new

curriculum was introduced in 1981, this time; it was based on the neobehaviourist conceptions of learning and structured around behavioural objectives. A new basic school regulation was imposed, which foresaw a new reorganisation of the school subjects at the elementary level and, most of all, which made the teaching of these subjects compulsory every week, for a specific predetermined length of time, in an effort to meet the said objectives of the programs.

Content integration, which was already considered a real *success story* in Quebec since its introduction during the preceding decade, became a *modus operandi* that intended to solve the implementation problems arising from both current school programs and current basic school regulation. In fact, the teachers and the school organisations adopted the same discourse that had already been put forth for many years by governmental agencies. In 1982, a consultative arm of the of Quebec Ministry of Education, the Conseil supérieur de l'Éducation (Superior Council of Education), published a report "*Le sort des matières dites «secondaires» au primaire"*, (The fate of "secondary[2]" subjects in elementary school). This notice recommended that, based on the acknowledgement that teachers had already adopted as standard practice the "integration" of various subjects, that subject matter integration be one of the means to ensure the teaching of all the subjects in the curriculum. In 1989, the committee came back in full force by considering that one of the three most important paths of action to explore "concerned the integrated teaching of the subject matter" (p. 23). Content integration was also strongly supported by the school management (Bacon 1996), which found itself wedged between the constraints of basic school regulations and social expectations, which gave priority to the teaching of French and mathematics.

Because the teachers were little or badly prepared for these changes, because resources and means were either rare or inappropriate, because the guidelines did not correspond to their usual practices, nor with to their deep convictions, nor with the parents' expectations, teachers salvaged the concept of subject matter integration, still vigorously promoted by the Ministry of Education, to ensure an organization of their teaching that would allow them, after some minor changes, to resort to their usual practices. (Larose, Lenoir 1995, 1998; Lenoir 1991, 1992). As we emphasized in 1992, "the use of interdisciplinarity or content integration would only superficially modify the teaching practice for a large part of the teachers in elementary schools. […] subject matter integration would then become an excellent means for the main teacher in the classroom to maintain a hegemonic teaching of language and mathematics while giving the impression of teaching other school subjects using them as a pretext or building material or finally only ensuring a minimal teaching of the subject" (p. 46). It is not surprising that the Ministry of Education quickly realized, in spite of a more or less long and constant implementation phase that the programs, were not-applied or non-applicable (Government of Quebec 1990).

As far back as 1987, severe criticism of the existing teaching model surfaced and amplified. For example, according to the *Conseil supérieur de l'Éducation* (1994), the Ministry of Education had promoted since 1982 subject matter integration, it is in "*dans une sorte de prise de ("mauvaise") conscience d'un acte manqué*" in a type of ("faulty") awareness of a failed attempt (p. 52-53), the curriculum structure that was then developed did not allow, within its compartmentalized organization, either convergence or coherence... this had been forgotten by its designers! The programs suffered from dispersal of contents (some 3000 objectives) "the notice ends by concluding that the programme does not particularly facilitate, content integration" (*Ibid.*, p. 53). After many commissions and reports, a new curriculum finally appeared at the elementary level in 2001 (Government of Quebec 2001). This curriculum was characterized among others by (socio)constructivist background assumptions, a competency approach, a grouping of the subject matters into five areas (Languages, Mathematics and Sciences, Social Sciences, Arts and finally Personal Development), as well as an interdisciplinary perspective and transversal competencies.

At the same time, during the 90's, the concept of subject matter integration is condemned, rejected and replaced by the concepts of interdisciplinarity and transdisciplinarity. Today, in agreement with many American orientations (Beane 1997; Dessel 1958; Goodlad, Su 1992) and with the selected option of constructivism, integration refers to a concept that focuses more on learning (the integration of learning processes and the integration of knowledge that ensue from this). Presently only the term "interdisciplinarity" is used in the school system. Exceptionally, older teachers still use the expression "subject matter integration". This expression has however been totally excluded from official texts ever since a government report considered it as a restrictive notion (Government of Quebec, 1997).

2 Secondary in the sense of second importance and not secondary school or high school.

## 3. presentation of the research projects and the conceptual framework

### 3.1 Presentation of the research projects

It is following the analysis of elementary teachers' practices, which claimed to use an interdisciplinary approach (of subject matter integration), that we started, in 1985, our research on teachers' representations regarding interdisciplinarity and its implementation in their classroom practices. Along with a doctoral thesis, we have directed or taken part since then in eight three-year research projects financed by Canadian funding agencies. Table 2 outlines very briefly the main information related to the different research projects that were carried out. It identifies where and when the research projects were conducted, as well as outlines the type of sampling of the population and the methodological procedures generally used. More than 1 200 elementary teachers and even 1 800 if we include the pre-service teachers – took part in these researches. In order to complete the research table we added the project carried out by the *Conseil supérieur de l'éducation* in 1980-1981, which was based on another research (Ramoisy 1982) involving 330 educators performing different functions in 30 school boards and finally the 1988-1989 Laforest (1989) doctoral research. However this does not allow us to claim generalization for the results obtained. It would be very unwise to take this direction. What emerges clearly from the various analyses that were carried out are strong tendencies in many respects regarding the representations of interdisciplinarity as well as its use.

**Table 2**
**The considered research projects: overall picture, sample size and procedure**

| Period | Title of the research project | Research sites | Methods | N | Researchers |
|---|---|---|---|---|---|
| 1980-1981 | *What happens to school subjects that are considered "secondary"?* | Educators from 30 school boards + 25 groups | Two inquiries, one "home-made" | Unspecified number of teachers | Conseil supérieur de l'éducation (identified "CSE 1980-1981") |
| 1988-1989 | *Diagnosis of the teaching of Humanities in the French Catholic elementary classroom* | Urban and semi-urban environments | Inquiry type questionnaire | 107 teachers | M. Laforest (identified "Laforest 1988-1989") |
| 1990-1991 | *Relationship between interdisciplinarity and integration of learning in the teaching of the elementary programme in Quebec* | Rural and mostly semi-rural environment everywhere in Quebec | Inquiry questionnaire *Post hoc* Validation: instrument to determine different profiles of pedagogical intervention | 250 teachers | Y. Lenoir (identified "Lenoir 1990-1991") |

| Period | Title of the research project | Research sites | Methods | N | Researchers |
|---|---|---|---|---|---|
| 1992-1995 | *The representation of elementary teachers of Quebec in (with) regards to interdisciplinarity in Education and its actualisation in practice* | Rural and semi-urban environment of Quebec | Inquiry questionnaire open-ended and closed questions<br>Identification scale for the pedagogical intervention models, locus of control and school subjects stratification (end of the process)<br>Semi-structured interviews at the end of the process | 200 Teachers<br><br><br><br><br><br>13 | Y. Lenoir, F. Larose<br><br>(identified "FCAR 1992-1995") |
| 1995-1998 | *Didactic*[3] *competencies and training of elementary teachers from an interdisciplinary perspective* | Urban and semi-urban environment of the school board of Sherbrooke | Semi-structured interviews<br><br><br>Conceptual definition<br>Inquiry questionnaire | 32 Teachers, Professors, Lecturers<br>66 Students<br>312 Teachers, Professors, Lecturers, Students | Y. Lenoir, F. Larose, C. Spallanzani, D. Biron<br><br>(identified "CRSH 1995-1998") |
| 1997-2001 | *Use of didactic materials by elementary teachers: an interdisciplinary approach* | Semi-urban and rural environments of Montérégie school boards | Video of the practices<br>Inquiry questionnaire | 9 teachers<br>54 teachers | C. Spallanzani, D. Biron, M. Laforest, F. Larose, Y. Lenoir, G.-R. Roy<br>(identified "FCAR 1997-2000") |
| 1998-2001 | *Use of interdisciplinary materials by elementary teachers: impact on their practice* | Urban and semi-urban environments of (in) the Sherbrooke school board | Semi structured interviews:<br>planning<br>general<br>of further development<br>Inquiry questionnaire | Teachers :<br><br>39<br>150<br>41<br>61 | Y Lenoir, F. Larose, G.-R. Roy<br><br>(identified "CRSH 1998-2001") |
| 2001-2004 | *Relationship between the curriculum and educational intervention in Quebec elementary education* | Urban and semi-urban of two school boards of the region of Montréal | Semi-structured interviews:<br>general<br>planning<br>feedback<br>Focus groups<br>Videos of the practices<br>Inquiry questionnaire | Teachers:<br><br>14<br>12<br>12<br>12<br>12<br><br>24<br>487 | Y. Lenoir, M. Boutet, C. Garant, J.-C. Kalubi, F. Larose, G.-R. Roy, C. Spallanzani<br><br>(identified "CRSH 2001-2004") |

3 Regarding the teaching and organisation of knowledge in a *learning situation*

| Period | Title of the research project | Research sites | Methods | N | Researchers |
|---|---|---|---|---|---|
| 2002-2005 | *The link relationship between future elementary teachers: appropriation practices or determination of practice?* | Pre-service teachers from four universities of Quebec | Semi-structured interviews: planning<br>feedback<br>Videos of the practices<br>On the TIC<br>General inquiry questionnaires<br>on the steps<br>on didactics | Pre-service teachers:<br>8<br>8<br>8<br>17<br><br>348<br>270<br>830 | Y. Lenoir, D. Biron, M. Boutet, C. Deaudelin, O. Dezutter, J.-C. Kalubi, A. Hasni, F. Larose, J. Lebrun, M.-P. Morin, C. Spallanzani (identified "FQRSC 2002-2005") |
| 2004-2007 | *Contribution to the development of a professional "system of reference[4]" to teaching practice: to what professional competencies elementary teachers resort to or say they resort to in their practice?* | Urban and semi-urban environment of the school board of Sherbrooke | Semi-structured interviews: general, of further development, planning, feedback<br>Focus groups<br>Videos of the practices<br>Inquiry questionnaire | 7 teachers<br><br><br><br><br>Teachers of the school board (N = to come) | Y. Lenoir, C. Deaudelin, J.-F. Desbiens, A. Hasni, F. Larose, J. Lebrun, P. Maubant, C. Spallanzani (identified "CRSH 2004-2007") |

In order to facilitate the eventual identification of these research projects in this article, we refer to them by the acronym of the funding agency or by the author and the years during which they were conducted.

The data processing called upon mixed methods (Creswell 2002; Johnson, Onwuegbuzie 2004; Shaffer, Serlin 2004; Tashakkori, Teddlie 2003), which cross qualitative treatments (content analysis and lexicometric analysis of the v*erbatims*) with the quantitative treatments (descriptive analysis, factorial correspondence, clusters, calculation of the contingency coefficients, hierarchical regression analysis of variables, etc.) of the data. The use of mixed methods seems even more appropriate to analyse teachers' practices since the latter have multiple and complex characteristics and because it is important to cross the data from the teachers' discourse (the teachers' description of their practice) (indirect observation) with the direct observations of the practices in classroom, which are videotaped. Data processing, on a qualitative level, is based on various analysis models that ensue from the conceptual framework, which we have progressively developed over the years.

### 3.2 Components of the conceptual framework

Conceptually, we start with the finding that has been highlighted among others by Bru (1991) that there is a certain scarcity of empirical research that would allow us to better describe the practices implemented by the teachers. In fact, most research studies pertained to the teachers' thoughts, representations and beliefs (Altet 2002), in short, about the discourse related to their practices. This is why to call upon direct observation – that is what we have been doing for the last four research projects – as a complementary way to access teaching practice, besides the data collection devices based on the interview, on the inquiry questionnaire and on a literature review, have become necessary. But at the same time we must realize that this type of observation only allows us to gain access to the practices observed under the conditions of observation (Bru, 2002). Moreover, an analysis of 20 years of Quebec studies of teacher training (Vanhulle, Lenoir 2005) confirmed for Quebec the results of American meta and mega-analyses on teaching practices study (for example: Kane, Sandretto, Heath 2002; Wideen, Mayer-Smith, Moon 1998; Wilson, Berne 1999) which emphasizes among others the weakness of the epistemological and methodological aspects of the researches dealing with teaching and teacher training.

4 Référentiel: document that analyses the tasks attributed to a teacher.

In order to analyse teaching practices, that is a collection of activities involving movement and a collection of singular and complex operational discourses made up of many overlapping dimensions in situ, rooted in the daily immediacy, before (preactive phase), during (interactive phase) and after the action (postactive phase) (Altet 2002). It is therefore important to grasp the practice according to its timing. Friedrich (2001) shows that the subject's deliberate action varies according to its temporal placement. Thus, during the preactive phase, the projection as an anticipated action rests on "reasons-in-sight-of" (a projective aim), whereas at the postactive, retrospective phase, the interpretation of the finished action, "result of an *a posteriori* reflection linked to the effort of objectivation" (p. 103) is characterized by "reasons-because" (a justifying argument). As for the interactive phase, it is based on actions which can be deliberate if they are confronted with "problematic possibilities", or non deliberate if they are part of "open possibilities". This absence of reflexive analysis ensues from the fact that these actions represent for the subject an empirical certainty either they can be related to *habitus*, or they do not even appear as possibilities, etc. They are a product of a common sense rationality which does not claim truth or generalization, but which falls under a preoccupation of immediate knowledge and applicability.

The orientation of our research projects is not of a prescriptive nature and does not aim to produce models for teaching practice. Our concern is rather to produce models of teaching practice that would be of a descriptive aim, comprehensive and if possible explanatory. That is why, we seek to analyze the teaching practice in its complexity. That is why, we have adopted educational intervention as our central concept keeping in mind that it is multidimensional. It refers in fact to ten dimensions developed in terms of relations: historical, contextual, epistemological, curricular, didactic[5], of mediation, psychopedagogical, organisational, socio-affective, moral and ethical dimensions (Lenoir, Vanhulle forthcoming). This is a theoretical construct whose basic parameters are the concepts of educational aims, adopted educational processes and their conditions of operationalization, that is to say how the different interactions between these components can be conceived and actualised through time (Lenoir 1991; Lenoir, Roy, Lebrun 2001; Spallanzani, Biron, Larose, Lebrun, Lenoir, Masselter, Roy 2001).

The structuring attributes of the concept of educational intervention are: complexity, interactivity, evolution, inclusion, joining of several angles of approach, dialectical relations, finalization, accountability, institutional recognition, intrusion, intersubjectivity, well meaning supervision, logic of action, situated action, integrating and regulating processes of the learning processes, mediation (Lenoir 2005; Lenoir, Larose, Deaudelin, Kalubi, Roy 2002). This construct allows us to approach the teaching practice during these different phases. It highlights the existence of a transitional and transactional space in which the interactive relation develops among the students and between the students and the teacher, which brings us to the situation as defined by Vergnaud (1991), that is the complexity of the cognitive task to be accomplished in which teaching devices are used. Thus the construct emphasizes the external central mediatory function provided by the teacher who is acting in the teaching-learning relation, which is established through the internal cognitive mediation exercised by the students on the objects of knowledge (Lenoir 1993, 1996; Lenoir *et al*. 2002). The concepts of student's cognitive mediation and of the teacher's external mediation, of a pedagogical and didactic type, are closely related to the concept of pedagogical intervention. Finally, the latter is based on related concepts and the most important are the situation, the device, the teaching-learning steps, the relation to knowledge and of course, the integration (Lenoir, Geoffroy 2000) and interdisciplinary (Lenoir, Sauvé 1998; Lenoir, Rey, Fazenda 2001) concepts.

In a few words, we distinguish educational interdisciplinarity from scientific interdisciplinarity in the following way: the first one's role is to spread knowledge and to train social agents in an educational context, whereas the second's aim is to produce original knowledge or new disciplines in order to meet social expectations. The object of educational interdisciplinarity is school subject matter not scientific disciplines (Lenoir, Sauvé 1998). In short, although many school subject matters come from scientific disciplines, their objectives and their contents are different. It is the same for their application procedures and their reference system, the former imply individual education and relate to the school

5 As Kampeas (1999) points it out, «The English lexical choices that most readily and naturally suggest themselves as renderings of didactique (noun and adjective) are *didactics* (n.) and *didactic* (adj.). […]. Our concern, however, was with the fact that each of these English words, didactics and didactic, today has associations we wished to eschew. Didactics has been used to designate a field of educational research that flourished for a time but is now being left behind as having too strictly limited itself to the technological perspective on instruction. Didactic in non-specialized language is often pejorative, evoking an intrusive teaching agenda […]. Our earlier solution was to leave the noun in French (the equivalent approach having been taken by writers in the German tradition who introduced the field of *Didaktik* to English-speaking readers), and to use *instructional* as the adjective. This we later realized to be unsatisfactory […]. And so we have gone ahead with didactics and didactic» (p. 1-2).

subject knowledge while the latter involves research and uses scientific knowledge as a reference system.

## 4. Main results

Being unable to present all the results obtained during the past 20 years of research, we will only examine two groups of results which have changed little during all these years and which allow us to describe interdisciplinary representations and practices.

### 4.1 Representations and teaching practices regarding interdisciplinarity

Interdisciplinarity is a very widespread term in the North American school environment (Lenoir 1995, 1999) that is used as much by teachers, school administrators, government employees, designers of programs as well as by the university teachers trainers. But as we pointed out (Lenoir, Sauvé 1998) several studies led us to realize that this term was saddled with several different meanings. This polysemy, which is sometimes close to cacophony, does not help to identify all the meanings that it covers. The word suffers indubitably from incoherencies, which are at the source of drifts and obscureness. This is the case in Quebec where the concept of interdisciplinarity is given many meanings, which, at the very least, cause semantic confusion. To this is added a heavy past involving subject matter integration, which recommended implicitly an indistinct teaching of the subject matters, and ideological discourses and treatment (by the means of some textbooks) that subtly justified a social hierarchy of the subject matters of which the consequences will now be explained. It is therefore not astonishing that the teachers bathe in a blur, on the conceptual level, and claim to resort to teaching practices that they qualify as interdisciplinary, but these practices appear doubtful to say the least on the interdisciplinary level.

Based on the results drawn from the different research projects, we have identified four approaches to interdisciplinarity that predominate in Quebec for elementary teachers. (figure 1). Laid out on a Cartesian axis (x and y), these four dominant approaches form the extreme poles of two crossing continuums. If the *x* axis (holism-eclecticism) concerns the degree of fusion or of dispersal of the school subjects, the *y* axis (hegemony-pseudo-interdisciplinarity) attests to the intensity of the relations between the school subjects, relations which range from domination to the absence of any real link between the subject matters. As for the ac and bd dotted arrows they show that interdisciplinary practice can not only be associated with one approach, but also be found between two approaches.

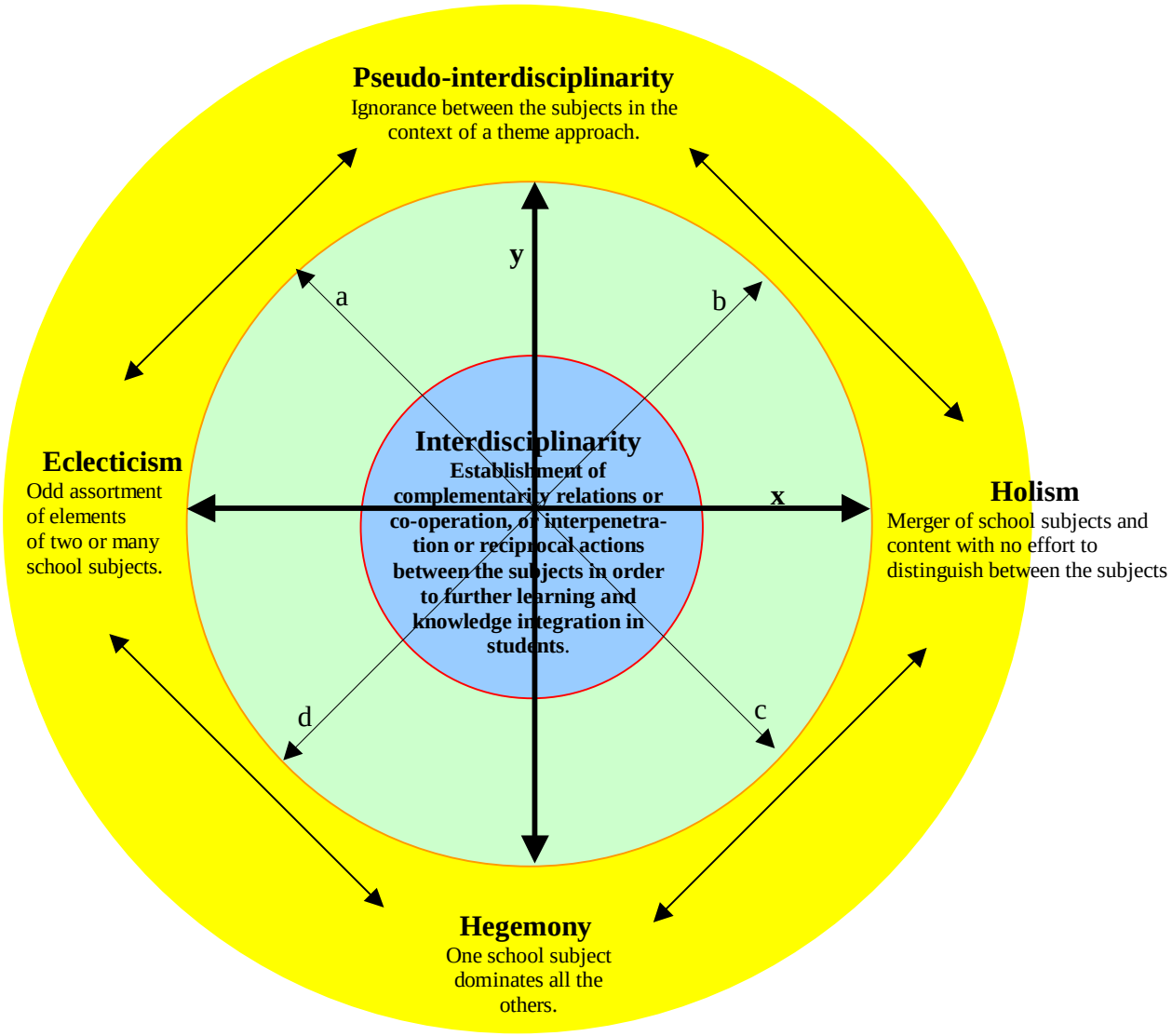


**Figure 1 – Trends in interdisciplinary practices in Quebec elementary education**

This typology of all representations and practices of interdisciplinarity by teachers (Lenoir, Larose, Geoffroy 2000) points out the impressive level of confusion, which appears in the educational world as far as this concept is concerned. This confusion actually is the result of the layering or superimposing of numerous non-complementary or even opposed conceptual orientations, which lead to praxeological disorganization. Teachers seem to be torn between different options coming from different sources. Several key-factors allow us to understand the reasons which lead elementary teachers to choose eclectic and non-rational teaching practices that are not based on scientific premises: the strong social pressure that emanates from the influences of the media, of parents or of administrative authorities. These influences tend to promote an increase in the time and attention devoted to the objectives related to the teaching of the basic subjects of mathematics and French language. Other key-factors are the lack of understanding of the background assumptions of the teaching curricula and of their implementation, the deficiency of the teachers disciplinary training, epistemological representations of knowledge and of the processes of knowledge acquisition, the heavy influence of pedagogical

traditions, an emergency-based logic of action that is based on common sense and intuition rather than on a reflexive analysis of the task (curriculum, prescription, constraints, etc.) or of the teaching practice; etc.

Teachers, when talking about interdisciplinarity, only take into account the pedagogical level, that is they consider only what occurs in the classroom, they stay close to the immediate action that they experience such as classroom emergencies and absolute constraints. Their conception of interdisciplinarity is therefore reduced to generalizations revolving around the fact that interdisciplinarity concerns several subjects and they do not attempt to use attributes to describe it. Neither do they mention the didactic aspects, which would allow them to reflect on their relation to knowledge or on the treatment that knowledge must undergo within the framework of a teaching-learning process and even less do they refer to the curricular aspects which however are essential in order to set up the conditions for a successful approach to interdisciplinarity. Subsequently, their classroom practices of interdisciplinarity are poorly backed-up and very similar to their hesitant representations. This same phenomenon can also be observed among pre-service teachers, as shown by a recent study (FQRSC 2002-2005) carried out among 348 students in education from the four main French-speaking Universities of Quebec. Other data gathered for various research projects, including the most recent ones, based on interviews and research questionnaires also point out the absence of conceptualization of interdisciplinarity by elementary teachers in Quebec. Because there is a lack of attributes to describe the particulars of interdisciplinarity this absence of conceptualization prevents them from having the specifics to guide the teachers in the process of implementation of teaching practices, which would in actual fact apply to an interdisciplinary approach.

The results of the various studies show that the theme-based pseudo-interdisciplinary approach seems to be used by many teachers who teach the first cycle of elementary education in Quebec. This trend is mainly caused by their strong desire to stimulate the interest of their students. On the contrary, the hegemonic approach, where certain subjects are only used in actual fact as a pretext or as an enhancement of other subjects, is mostly used by teachers of the third cycle of elementary. This tendency could be explained by the fact that these teachers tend to give priority to teaching French. The eclectic approach, which is a profoundly restructuring one, where subject contents are regarded as a kind of '*pot-pourri*' from which one could draw contents from randomly, it is used by teachers involved in all years of elementary education. As far as the holistic approach is concerned, which is based on the refusal to give any specificity to subject matter in the name of the existence of a natural approach, it is mostly used by the teachers who still believe in the pedagogical values that prevailed in Quebec during the seventies. These values promote an open pedagogy centred on the student's interests. Furthermore, teachers whose main objective is to meet the curricular expectations on a purely administrative basis also use all four approaches. When such is the case, these approaches tend to be justifications for the absence (or quasi-absence) of some subjects that are supposed to be mandatory and registered in the official curricula, but that are in fact socially considered as secondary. The teaching of art, natural sciences and social sciences are particularly targeted (Lenoir, Larose, Grenon, Hasni 2000). The discourse of teachers on interdisciplinarity then actually disguises teaching practices which is strongly influenced by the primacy of certain socially valued subjects and the dilution of socialized knowledge which is characteristic of the so-called "secondary" subjects by devoting more and more teaching time to the first subjects.

Very few elementary teachers tend towards interdisciplinarity, which is not oriented towards one or the other of these poles, on that is located towards the crossing of the axis formed by the two continuums. This location would generate, on the one hand, some kind of reciprocal dependence, without any predominance or any ignorance between school subjects, depending on the teaching objectives. On the other hand, this would allow every subject to be taken into account, since their potential complementarities and their effective and unquestionable interrelations would be pointed out in terms of cognitive contents and necessary actions to undertake in order to elaborate a conception of the human, social and natural reality, so as to express or interact with this reality, whether a centripetal or centrifugal perspective is adopted. In such a perspective, interdisciplinarity could never in any case become an end in itself.

### 4.2 Relative importance and role of interdisciplinarity

In the very heart of our research is the double question of the relative importance and role of interdisciplinarity, as elementary teachers understand it. This double question refers to a theoretical framework based on curricular sociology developed by the British "New Sociology of Education" (*Ibid.*, 2000). Beyond the definition and the specificities that teachers could associate with interdisciplinarity, the concept was also studied from several angles, implying each time the development of the rational justifications by the teachers: of the general hierarchical order of the subjects taught at the elementary level and according to the type of knowledge; the distinction between basic subjects and secondary subjects; the average time per week devoted to the teaching of the various subjects; the different ways

the subjects can complement each other; the forms of operationalization that are most commonly used. In this text, we will only deal with the first three angles.

#### *4.2.1 Hierarchy of the school subjects taught at the elementary level*

The results gathered from the research carried out since the mid-eighties reveal a great stability in the hierarchical order defined by teachers of the various subjects that comprise the elementary level curriculum (table 3). French, as mother tongue and mathematics always ranked first. A few shifts have however been observed regarding the other subjects, linked among other to subjects that have been added or removed from the list, or reorganisations of the subjects divisions depending on the three curricula which were implemented over the last 25 years. We also formulate the hypothesis that several of these shifts are the result of several biases related to the procedure used for the data collection. For instance, the study carried out by Laforest in 1988-1989 was done on teachers from urban areas, and especially from the region of Montreal, where religious beliefs and the corresponding social pressures are less strong than in rural areas. This phenomenon is identified in a relatively systematic way within the scope of the latest Canada-wide study dealing with identity and religious practices (Beyer, 1997).

**Table 3**
**Hierarchical order of subjects taught in elementary school according to five inquiries: Overall picture**

| Rank | CRSH Research (1980-1981) | Laforest Research (1988-1989) | Lenoir Research (1990-1991) | CRSH Research (1992-1995) | CRSH Research (1995-1998) | FQRSC Research (2002-2005) |
|---|---|---|---|---|---|---|
| 1 | French | French | French | French | French | French |
| 2 | Mathematics | Mathematics | Mathematics | Mathematics | Mathematics | Mathematics |
| 3 | Physical Educ. | Social sciences | Social sciences | Social sciences | Social sciences | Geo., Hist. + Cit. |
| 4 | Social sciences | Natural Sciences | Physical Educ. | Natural Sciences | Natural Sciences | Siences and |
| 5 | English | English | Natural Sciences | English | English | Technology |
| 6 | (Health | Physical Educ. | English | Pers. + Soc. | Physical Educ. | Ph. educ. + |
| 7 | education) | Arts | Personal.+ Soc. | Educ. Religious | Pers. + Soc. | Health |
| 8 | Moral Education | Pers. + Soc. | Educ. | Educ. | Educ. | English |
| 9 | Natural Sciences | Educ. | Religious Educ. | Moral Educ. | Arts | Arts |
| 10 | Religious Educ. | Moral Education | Art | Art | Moral Education | Drama |
| 11 | (Sex Education) | Religious Educ. | Music | Phys. Éduc. | Music | Music |
| 12 | Plastic Arts | | Moral Education | Music | Drama | Moral Education |
| 13 | Music | | Drama | Drama | Dance | Dance |
| 14 | Drama | | Dance | Dance | Religious Educ. | Religious Educ. |
| 15 | Manual Activities | | | | | |
| | Dance | | | | | |

Two cases are particularly interesting since they show the strong influence of the collective social representations on the hierarchy of school subjects that are established by teachers. The decrease in the relative importance granted to religious education is undoubtedly due to an increasing rejection of religion by the Quebec educational system, to the point that the link between religion and administrative structures disappeared officially in June 1998 with the replacement of religious school boards (Catholic or Protestant) by school boards created on a linguistic basis (French or English-speaking). Furthermore, were are currently witnessing a decrease in the average age of elementary teachers and we can therefore assume that new elementary education teachers are not as deeply committed to the Catholic faith as their predecessors, or at least they consider that religious education should not be part of a formal education. This hypothesis actually corresponds to the statement recently made by the Catholic committee of the Conseil supérieur de l'éducation (Dubois and Bouchard, 1997), and to the proposals of the *Report of the taskforce on the place of religion in the school* (Government of Quebec, 1999). As far as English is concerned, we venture to suggest that its place is linked to two factors: the area in which the teachers responding to the survey live shows that this subject matter is more important in urban and industrialized areas, where the presence of English is more visible and regarded as necessary; the attitudes of teachers, according to their social, cultural and economic origins, as well as to their political beliefs, play a substantial part in their appreciation of the importance of learning a language which is officially regarded as a second language, and not as a foreign language .

It is interesting to note that these results converge, at least partially, with those of a study of 12 member countries published in 1995 by the Organisation for Economic Co-operation and Development (OECD). The results showed, as did another OECD (1997) publication that re-examines the results, that the mother tongue and mathematics are also ranked first and second in terms of the importance attached to a subject in education. On an evaluative scale from 1 to 100, these subjects received an average of 90 and 85 respectively. Then came foreign languages (78), computer sciences (72) and sciences (65),

social sciences (60), citizenship training (58) and physical education (55). technology (50) and the arts (37) are at the end the list.

If we consider only the latest results available, the 2002-2005 FQRSC research, aimed at the pre-service teachers of the four main French-speaking universities in Quebec (Laval, Montréal, UQAM and Sherbrooke), we find similar results.

Three studies (Lenoir 1990-1991, FCAR 1992-1995, CRSH 1995-1998) allowed us to question elementary teachers more specifically on their hierarchisation of school subjects regarding the contribution of each one of the subjects to the types of knowledge recognized by the vocabulary used in the educational world. Results tend to systematically favour the same two school subjects for the development of knowledge and skills. The social sciences and natural sciences, whose main reason for being or "raison d'être" are nevertheless the conceptual production of the human, social and natural reality, are merely understood as ways to gain access to general culture which is considered of little use and above all considered only from a techno-instrumental point of view. The social sciences and natural sciences follow only after English as a second language in importance. This trend illustrates the clearly instrumental approach that characterises elementary education and its representation. It is so strong that, in the new curriculum implemented in elementary education since 2001, although it is socio-constructivist in orientations, the natural sciences and social science programs were deleted from the first two years of elementary education in order to offer more time for French and mathematics teaching. The results of the 2002-2005 FQRSC research show that the large majority of future teachers are delighted with this deletion.

#### *4.2.2 Distinction between basic subjects and secondary subjects*

Regarding the distinction between basic subjects and secondary subjects (this distinction is commonly used in everyday language in different educational circles). This distinction has been steadily establishing itself over the last 25 years. In actual fact, only French and mathematics are considered basic school subjects – despite the passing exception of English (Lenoir 1990-1991, 1992-1995 FCAR research) –, all other school subjects are considered secondary. A finer analysis reveals a large gap between the basic subjects and secondary subjects, the latter can be grouped in two distinct categories which vary very little over the years: the subjects ranking between the third and the sixth place are regarded as more important than the others (English, social sciences, science, physical education, music and visual arts), the last ones being totally neglected (moral education, religious education, drama and dance).

The 2002-2005 FQRSC study shows quite similar results for pre-service teachers, as shown in table 4. The priority granted to mathematics over French could possibly be due to the importance given to this subject in the teacher training.

**Table 4**
**Identification of the basic and secondary school subjects by pre-service teachers from the four main French-speaking universities of Quebec (FQRSC Research 2002-2005)**

| Subjects | Basic subjects | Secondary subjects |
|---|---|---|
| Mathematics | 97,0 | 03,0 |
| French | 92,6 | 07,4 |
| Geography, History and Citizenship Education | 87,1 | 12,9 |
| Sciences and Technology | 81,0 | 19,0 |
| English | 70,9 | 29,1 |
| Physical and Health Education | 71,6 | 28,4 |
| Moral Education | 29,7 | 70,3 |
| Arts: Plastic Arts | 15,7 | 84,3 |
| Religious Education | 15,4 | 84,6 |
| Arts: Music | 09,7 | 90,3 |
| Arts: Drama | 06,7 | 93,3 |
| Arts: Dance | 03,4 | 96,6 |

Also regarding a study that has just started in which we will follow seven experienced teachers from the same school board during three years in order to describe and understand, within the framework of a close interaction with them, their teaching practices and their underlying rationales. Once again, we find a hierarchical structure composed of three groups of school subjects: French and mathematics rank in

the first two places of this hierarchical classification. Then follow physical education (a restructured subject with the introduction of health education), science and technology, geography, history and citizenship education (new denomination for social sciences with the addition of citizenship education), music and English as a second language. In the third block are theatre, dance, moral education and, finally, catholic and protestant religious education.

It is interesting to investigate which arguments teachers use in order to establish this distinction between basic subjects and secondary subjects. Table 5 briefly outlines them.

**Table 5**
**Teachers' arguments to distinguish**
**basic subject matters from secondary school subjects**

| Basic subjects matters | Secondary school subjects |
|---|---|
| - They are essential for the academic success, the foundation of all knowledge.<br>- They are essential to education because of their utilitarian dimensions.<br>- They are essential for the social success. | - Based on general knowledge, culture, and personal development.<br>- Complementary to the basic school subjects.<br>- Personal enrichment. |

According to elementary teachers, the basic subjects are mainly centred on the development of cognitive abilities, whereas secondary subjects mostly aim at developing the cultural and affective dimensions of the students. For most of these teachers, especially regarding social and natural sciences, their social representation of the secondary subjects reduces its relative importance and role within the process of the educational development of a human being. In these conditions, how is it possible to conceive a teaching program for French and mathematics, which would not be essentiality instrumental? And how is it possible to conceive a teaching program which is not based on realistic epistemological conceptions and that are not updated through the transmission of reified knowledge?

#### *4.2.3 Average weekly time devoted to the teaching of the various school subjects*

Finally, when we observe the average weekly time devoted to teaching the various subjects by elementary teachers, as the various studies point out until the latest curriculum reform in 2001, it appears that teachers devoted an average time to subjects that is inferior to what was prescribed by the basic school regulations imposed by the Ministry of Education of Quebec, naturally with the exception of French and mathematics, which occupy together on average 60% of class time – that is 10% more than the prescribed duration –, with a minimum of 30% of the time and a maximum of 95% of the weekly time (table 6).

**Table 6**
**Average time spent per week teaching the different subjects before 2001**

| School subjects | % of minimum time | % of maximum time | % of average time | Difference | % of time MEQ |
|---|---|---|---|---|---|
| French | 19,2 | 55,6 | 35,3 | 5,9 | 30,4 |
| Mathematics | 11,4 | 40,0 | 24,6 | 6,2 | 19,6 |
| Religious Education | 0,0 | 12,1 | 6,8 | 1,8 | 8,7 |
| Social Sciences | 1,8 | 12,2 | 6,1 | 2,0 | 8,7 |
| Physical Education | 0,0 | 12,1 | 5,3 | 2,0 | 8,7 |
| Natural Sciences | 0,0 | 12,1 | 4,4 | 1,7 | 5,4 |
| Moral Education | 0,0 | 10,6 | 4,3 | 3,5 | 8,7 |
| Plastic Arts | 0,0 | 9,8 | 3,9 | 1,7 | 4,3 |
| English | 0,0 | 12,2 | 3,7 | 3,4 | 4,3 |
| Music | 0,0 | 9,8 | 2,7 | 2,1 | 4,3 |
| Pers. and Social Education | 0,0 | 16,3 | 1,9 | 1,9 | — |
| Dance | 0,0 | 9,5 | 0,5 | 1,4 | 4,3 |
| Drama | 0,0 | 5,0 | 0,4 | 1,1 | 4,3 |

Regarding the reasons evoked to justify the decrease in the time devoted to these school subjects, teachers give various explanations, the main ones being:

– The school board defines the time to be devoted to each subject.

– These are secondary subjects.

– The lack of time to teach French or mathematics makes it necessary to draw from the time that should be normally devoted to other subjects.

– The pressures exerted by the school board and parents.

– Personal reasons, especially the lack of interest and the lack of training.

The first and the fourth of these reasons mentioned are external with respect to the dynamic of the class, and cannot be controlled by the teacher. The second factor is factual, and in some ways tautological (these school subjects are less taught because they are secondary; since they are secondary, these school subjects are less taught!). The third factor is a temporal one, and cannot be controlled by teachers either (very full programs or slow learning processes), because the responsibility of a schedule that differs from the one prescribed by the official program would have to be linked to factors related to the mesostructure, to the learning objects or the students. Only less than 5% of the reasons given mention the inability of teachers to provide teaching for certain programs, which would lead them to not devote time to these programmes. The little relative importance granted, if not the total disinterest of teachers for these school subjects is never mentioned. It should be noted that time is evoked as an exclusive factor in 40% of cases, and in 27% of cases associated with another reason, as shown by the categorization of this variable. This clearly illustrates that time is a key-variable for elementary education teachers. Teachers lack time, or at least they are convinced that they do. Therefore, solutions have been found in the form of subject integration in the past and of interdisciplinarity today.

**Concluding observations**

By quoting various authors, Forquin (1989) reminds us, citing Taylor and Richards, that “the curriculum is at the very core of the educative process” (p. 24) and, quoting Stenhouse, that “ the curriculum […] is actually ‘one of the essential means by which the dominant traits of a cultural system of a society are established” (p. 25). Therefore, the organization of the curriculum of a school system is not an object in which to lose interest, it has nothing that is accidental or innocent. It is rather a capital choice for a society which results from educational policy and from its social, political, ideological orientations, etc. (D’Hainaut, 1979), and whose curriculum content is developed according to a logical process which is put into action by various actors within a given operational model.

However, the results could lead us to believe, at least at first glance, that the curricular changes did not substantially affect the representations and the practices of interdisciplinarity for elementary teachers in Quebec. On the one hand, we claim, as we have already explained in a detailed analysis which goes far beyond the curriculum outlines, that the new curriculum does not significantly differ from the previous one (Gosselin, Hassani, Lenoir 2005; Lenoir 2001). Actually, it is clearly interpreted by the majority of teachers as the continuation of the previous curriculum as shown by the yet unpublished results of the 2001-2004 CRSH research. On the other hand, it is still too early, after five years of implementation, to efficiently determine the impact of the new curriculum on practices.

Nevertheless, a strong level of stratification of school subjects has been consistently observed over the last 25 years in Quebec elementary education. Which brings about a compartmentalization of education, as presented by Bernstein (1971, 1975, 1997*a*, 1997*b*) and Young (1971). Today, this compartmentalization tends to become stronger while incorporating little by little and for various reasons, the logic of secondary level education by increasing the number of “specialists” (teachers) working with students from the same class, and also where now the main teachers of different classes divide up among themselves the teaching of different school subjects whereas up until this time the main teacher was responsible for teaching all these subjects. On top of leading to a piece-meal education, this stratification leads, among other things, to a depreciation of several school subjects, and particularly the arts, which however offer a different way to conceive and express reality, as well as to put oneself in relation with reality, as opposed to the other school subjects which develop a science-based approach to the conception of self, of others and of the world (Lenoir 1991), a different mode of construction and expression of reality as well as a means of entering into relation with reality.

And since the elementary curriculum is undoubtedly compartmentalised, as defined by Bernstein (1971, 1977*a*, 1997*b*), even though intradisciplinary structures are quite frequent, on the discursive level, in the new curriculum, which favours a domain-based approach (Government of Quebec, 2001), the stratification of subjects is deeply rooted in elementary teachers’ minds. Furthermore, as shown by the factors resulting in the distinction between basic and secondary subjects, this stratification of subjects is

clearly observed in the allocation of teaching time, on schedule planning, but also in the conception of the relationship that teachers have with knowledge. Subsequently, interdisciplinary interaction, though crucial in order to allow students to understand the meaning of their learning activities and to simplify the integration of learning processes and of knowledge, between school subjects which are focused on the production of reality (social sciences and nature sciences) and those which are focused on its symbolic and formal expression (mother language, second language, mathematics), is poorly or not updated. When it is updated, this update is fictional or very rough, as today's so called interdisciplinary approaches tend to show. Indeed, the social sciences and the natural sciences are often nothing but a ploy or an excuse for the teaching of French and are therefore reduced to mere raw materials. On top of this serial conception, we can observe a socio-political and social-cultural conception of school subjects, which develop a strong disciplinary structure as well as the importance granted to instrumental learning, regarded as a guarantee of school… and social success.

Research results also show that if, in addition to the relation to time that was briefly discussed previously and which is a strong concern of elementary teachers, there exists a relation to knowledge that underlies the social representation of subjects in a serial and compartmentalised way, this relation is based on a realistic epistemological conception, we must not neglect to mention a relation to power which strongly influences teachers' behaviours. These teachers model their behaviours on the explicit or implicit expectations, whether real or imagined, which they deduct from the social surroundings originating from their school principal, from the school administrators or the parents (they attest to this explicitly in several studies). The 1982 Report of the *Conseil supérieur de l'éducation* already mentioned this, parents only have expectations for the teaching of French and mathematics, and largely ignore the educational function of the "secondary subjects": "For them, the rest of the educational program is nothing but an 'hors d'oeuvre' " (p. 13). It is not surprising to see the development, since at least the beginning of the 80's, that the public, popular and governmental discourse has put forward, the "back to basics", and, since 1995, a focus on the learning of basic-skills. These "essential" or "basic-skills" are in actual fact reduced in elementary education to learning to read, to write and to count. Today, we add socialisation to the acquisition of these abilities that is considered as a process of social integration leading to the respect of the codes and values "of life in a group and of citizenship" (Government of Quebec, 1997, p. 47). In this way, a reified vision of teaching contents (relationship to knowledge) integrated by teachers could be associated to the instrumentalist vision that is projected by the social surrounding (relationship to the world).

Finally, two other traits that help to understand the difficulties encountered by elementary teachers when choosing interdisciplinary practices: the first one is the absence of a real training in interdisciplinary practice by the university faculties which provide all credited and recognised training in Quebec, whether initial training or continuing education. A strong resistance by academics to either study this issue or to substantially modify the training programmes and consequently the teaching models, which leads to the upholding of a separation, despite changes (sometimes important ones) that were made over the last ten years, to partitioning between the courses, and also between the courses and the other components of the curriculum (practice teaching, etc.). The other trait refers to the overrating of socialization and the underrating of the acquisition of cognitive knowledge, which is clearly pointed out by the 2001-2004 CRSH study and by the current study (2004-2007 CRSH research). Therefore, the utilitarian perspective that is associated with an educational approach that is centred on the emotional and educational dimensions leaves little space for the development of cultural dimensions among young people in Quebec, even though the theme of cultural development constitutes one of the main orientations of the reform of the educational system in Quebec.

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